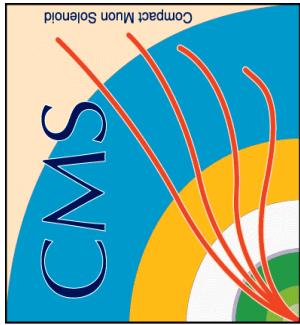


Jet Energy Corrections

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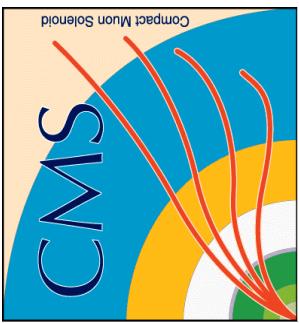


TWO Algorithms to make corrections :

- Go from Et_{gen} to Et_{rec} i.e.**
Looking for a reconstructed jets which correspond to a given Et of generated jets. Find a mean Et value of these reconstructed jets and correct it to be equal to Et_{gen} .

- Go from Et_{rec} to Et_{gen} i.e.**
Looking for a generated jets which correspond to a given Et of reconstructed jets. Find a mean value of these generated jets and correct Et_{rec} to be equal to this calculated Et_{gen} .

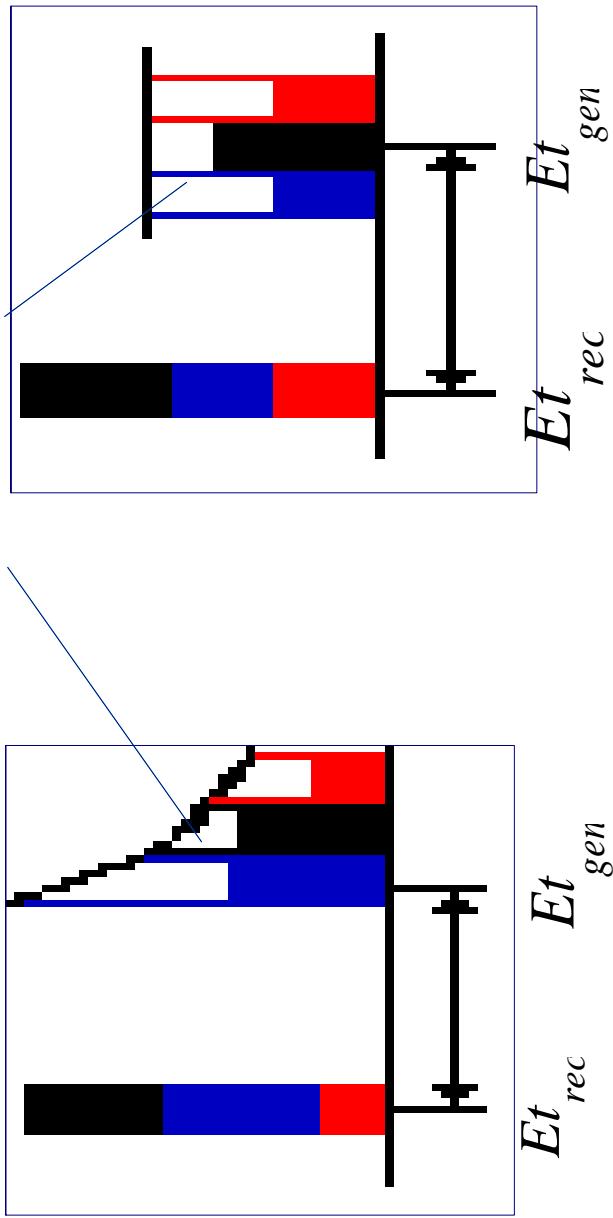
These two methods are different. The second one depence on spectra of generated jets. Let me show it.....



The second algorithm to make corrections (from Et_{rec} to Et_{gen})

These corrections depend on spectrum of generated jets

For example:



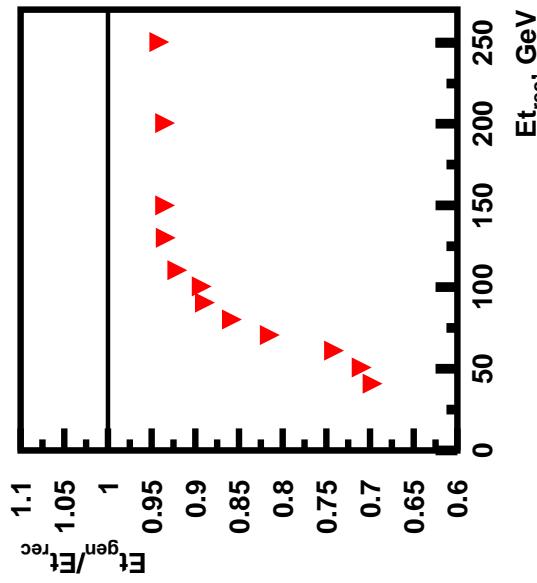
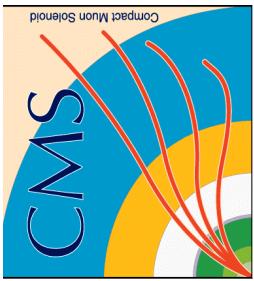
So that in dependance on spectrum of gen. jets different Et of gen jets correspond to one and the same Et of reconstructed jets

Consider what is the difference between corrections obtained using standard way and the new one for QCD jet spectrum.

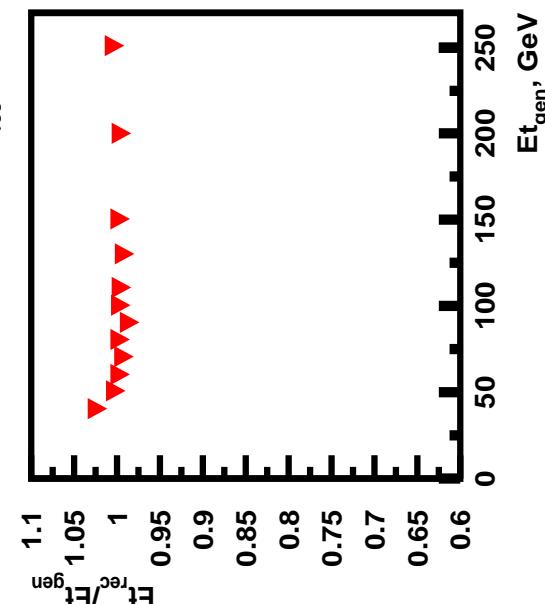
I couldn't obtain right QCD spectrum just using hit samples from new production. Because so far some samples are missing.

To get right QCD spectrum I at first generated jets in PYTHIA. Then from present hit samples I created a small database with pairs of generated jets and matching them reconstructed jets. After that for each jet generated with PYTHIA I searched for generated jet in this database which have almost the same Et, Eta, Phi values. This generated jet and corresponding reconstructed jet were considered as jets from right QCD spectrum.

Comparison of two algorithms to make jet energy corrections



It's usual plot with reconstructed jets corrected in usual way. E_t^{rec} here is equal to the mean E_t value of all reconstructed jets corresponding to a given E_t of gen. jets.

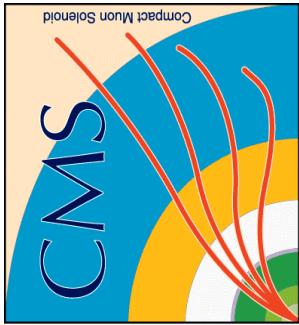


Here E_t^{gen} is calculated as a mean value of all generated jets which have a given value of E_t^{rec} . In other words it's most probably that reconstructed jet with a given E_t^{rec} comes from gen jet with calculated E_t^{gen} rather than from other generated jets.

Here reconstructed jets were corrected using corrections obtained in usual way.

This plot demonstrate that using standard corrections we overestimate E_t^{gen} of generated jets.

Conclusion



It was shown that jet energy corrections which make right correspondance between Et_rec and Et_gen have to depend on spectra of generated jets.

Because this method of corrections rely on montecarlo it can be used just for offline analysis. Probably using it for different physics channels it is possible to obtain better resolution in mass reconstruction. (for example H->bb). I'll try to study it.